

Request for Additional Information
Browns Ferry Nuclear Plant, Unit 2 (BFN-2)
ASME Section XI, Inservice Inspection Program Request for Relief

Request for reliefs 2-ISI-6 and 2-ISI-13 requests relief from for nine reactor pressure vessel (RPV) nozzle-to vessel full penetration welds and for the RPV standby liquid control nozzle inside radius section, respectively. The proposed examination of the nine RPV nozzle to vessel welds is to be performed using ultrasonic examination from the outside of the vessel. The percent coverage for these nozzles is 56% to 72%. The proposed examination of RPV standby liquid control nozzle inside radius is to be visual (VT-2) examination in conjunction with the Class 1 system leakage test. The Advanced Inservice Reactor Inspection System 21 device (AIRIS 21) and Enhanced Data acquisition System-II equipment (EDASTM-II) is used to ultrasonically inspect longitudinal shell welds from the inside surface of the RPV.

- a) Identify the percent of coverage for flaws located at the clad and nozzle weld interface when ultrasonic examination is performed in accordance with request for relief 2-ISI-6.

Percent of coverage for flaws located at the clad and nozzle weld interface are approximated as follows:

N2D, N2E, N2K - the clad and nozzle weld interface was examined utilizing an automated UT system and manual UT techniques at areas where the automated system was limited. Clad and nozzle weld interface percent coverage is approximated to be 62.5%

N3A, N3C - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface percent coverage is approximated to be 68.7%

N4D, N4E - The cladding has been removed from the feed water nozzles in accordance with NUREG-0619 requirement. "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking".

N8B - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface percent coverage is approximated to be 75%

N10 - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface percent coverage is approximated to be 50%



- b) Explain why the AIRIS 21 and EDASTM-II can not be utilized for examination of the welds and

inside radius section discussed in request for relief 2-ISI-6 and 2-ISI-13.

The configuration of the vessel and internal piping prevents access with an automated system as follows:

N-2D, N2-E, N-2K, N-4D, N4-E, N-8B - inaccessible due to piping and spargers
N-10 - inaccessible due to core shroud plate.

N-3A, N-3C, these are accessible but the technology has not been developed to perform the examination from the vessel ID for BWR's.

There are no automated systems PDI qualified to perform nozzle to shell welds at this time. Supplement 7 of Appendix VIII will be implemented November 22, 2002

c) Identify the increase in NDE examination coverage expected if the AIRIS 21 and EDASTM-II equipment can be utilized for ultrasonic examination.

See response above

Pertaining to Relief Request 2-ISI-15:

1.The licensee identified Code Case N-577, "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method A," as being the applicable Code requirement. The NRC has not approved this Code Case for use. However, N-577 does serve as a reference to relate the IGSCC welds, which fall under Browns Ferry's risk-informed ISI (RI-ISI) program, back to the true Code requirement, which is IWB-2500, Table IWB 2500-1, Figure IWB-2500-8(c). Therefore, relief should be requested from the requirement of ASME Code, Section XI, IWB-2500, Table IWB-2500-1. Please indicate which examination categories and item numbers from IWB-2500 apply to these welds (i.e. B-J, B-F, etc.)

TVA received a Safety Evaluation Report (SER) from the NRC dated January 19, 2001 (TAC No. MA8873), "BROWNS FERRY NUCLEAR PLANT UNIT 2, CODE RELIEF FOR RISK-INFORMED INSERVICE INSPECTION OF PIPING WELDS." This allowed TVA to utilize an alternative Risk-Informed Inservice Inspection (RI-ISI) program for BFN Unit 2. This program was developed in general accordance with the Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NPA-A, which was approved by the NRC staff. This report references the utilization of Code Case N-577 for the examination methods.

The Code requirement is Code Case N-577, N-577-2500, Table I, Examination Code Category R1.16.

2.In the licensee's basis for relief they state:

"Welds GR-2-15(OL) and DRHR-2-03 were examined in April 1999, prior to the Performance Demonstration Initiative (PDI) Program requirements being mandated by 10 CFR 50.55a(b)(2)(xv)(A)(2), utilizing NDE methods and techniques to the requirements of ASME Section XI Code, 1989 Edition, No Addenda."

Is 1989 supposed to read 1986, since that is the applicable Section XI code edition for the relief?

The correct ASME Section XI Code year for NDE is the 1989 Edition. At the time the examination of welds GR-2-15(OL) and DRHR-2-03 were performed the NDE program was to the 1989 Edition of ASME Section XI. The TVA Nuclear (all sites) NDE program was upgraded to the 1989 Edition in 1996. The Code of record for Unit 2 (component selection) is the 1986 Edition. This was referenced in "Inservice Inspection Program Unit 2", procedure 2-SI-4.6 G Paragraph 4.1

UNIT 2 REACTOR PRESSURE VESSEL FEEDWATER (N4) NOZZLE ULTRASONIC EXAMINATIONS

The BFN Unit 2 Reactor Pressure Vessel Feedwater (N4) Nozzles, N4A to N4F, the cladding on the inner radius section and the nozzle bore was machined off and removed in 1978. This was in accordance with the requirements of NUREG-0619, "BWR FEEDWATER NOZZLE AND CONTROL ROD DRIVE RETURN LINE NOZZLE CRACKING," Dated November 1980. This is documented in NUREG-0619, Table 1. See table below for Ultrasonic examination results. The ultrasonic examinations below are a combination of ASME Section XI Code Credit, Category B-D Item No. B3.100 and NUREG-0619 Augmented exams performed during the first and second Ten Year ISI Inspection Interval.

COMPONENT	CYCLE NO.	DATE	EXAM METHOD	RESULTS	COVERAGE
N4A-IR	1	5/20/78	UT MAN	ACCEPT	
N4A-IR	3	10/07/80	UT MAN	ACCEPT	
N4A-IR	5	11/10/84	UT MAN.	ACCEPT	
N4A-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4A-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%
N4B-IR	1	5/20/78	UT MAN	ACCEPT	
N4B-IR	3	10/07/80	UT MAN	ACCEPT	
N4B-IR	4	9/21/82	UT MAN	ACCEPT	
N4B-IR	5	11/10/84	UT MAN	ACCEPT	
N4B-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4B-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%
N4C-IR	1	5/20/78	UT MAN	ACCEPT	
N4C-IR	3	10/08/80	UT MAN	ACCEPT	
N4C-IR	4	9/21/82	UT MAN	ACCEPT	
N4C-IR	5	11/10/84	UTMAN	ACCEPT	
N4C-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4C-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%
N4D-IR	1	5/20/78	UT MAN	ACCEPT	
N4D-IR	3	10/08/80	UT MAN	ACCEPT	
N4D-IR	5	11/10/84	UT MAN	ACCEPT	
N4D-IR	5B	9/25/86	UT MAN	ACCEPT	
N4D-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4D-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%
N4D-IR	11	4/10/01	UT AUTO/MAN	ACCEPT	100%
N4E-IR	1	5/20/78	UT MAN	ACCEPT	
N4E-IR	3	10/08/80	UT MAN	ACCEPT	
N4E-IR	5	11/10/84	UT MAN	ACCEPT	
N4E-IR	5B	9/25/86	UT MAN	ACCEPT	
N4E-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4E-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%
N4E-IR	11	4/10/01	UT AUTO/MAN	ACCEPT	100%
N4F-IR	1	5/20/78	UT MAN.	ACCEPT	
N4F-IR	3	10/07/80	UT MAN.	ACCEPT	
N4F-IR	5	11/10/84	UT MAN.	ACCEPT	
N4F-IR	7	10/06/94	UT AUTO/MAN	ACCEPT	100%
N4F-IR	9	11/21/97	UT AUTO/MAN	ACCEPT	100%